Name: Date:

Polynomial Factoring solution (version 669)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 2x + 28 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(2) \pm \sqrt{(2)^2 - 4(1)(28)}}{2(1)}$$

$$x = \frac{-(2) \pm \sqrt{4 - 112}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{-108}}{2}$$

$$x = \frac{-2 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{-2 \pm 6\sqrt{3}\, i}{2}$$

$$x = -1 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $6 - 5i$ and $9 + 3i$ in standard form $(a + bi)$.**

Solution

$$(6 - 5i) \cdot (9 + 3i)$$

$$54 + 18i - 45i - 15i^2$$

$$54 + 18i - 45i + 15$$

$$54 + 15 + 18i - 45i$$

$$69 - 27i$$

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3. **Write function $f(x) = x^3 + 10x^2 + 19x - 30$ in factored form. I'll give you a hint: one factor is $(x + 5)$.**

Solution

	1	10	19	-30
-5		-5	-25	30
	1	5	-6	0

$$f(x) = (x + 5)(x^2 + 5x - 6)$$

$$f(x) = (x + 5)(x - 1)(x + 6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 3) \cdot (x - 1)^2 \cdot (x - 5)^2$$

Sketch a graph of polynomial $y = p(x)$.